CDO Case Study:

Content

History

CDO Group Inc. Real Estate Builders & Construction Company located in Chicago IL is our client. They provide multi-unit retail companies with a complete construction management solution on outsourced basis.

The CDO group specializes in partnering with companies when they are planning a multi-unit expansion and/or remodeling program. From process planning through punch list, we augment their existing staff with the right level talent necessary to get the program executed correctly, and the company does not have to carry additional staffing overhead.

The company found in 1997 by a group of client-side development professionals in an effort to address the changing and often unpredictable development schedules facing retail companies, CDO Group has quickly grown into one of the top firms servicing the multi-unit retail industry. With thousands successfully executed projects nationwide to our credit, our understanding of owner-side demands and the best-practices of the industry has given us the ability to help companies lower their G&A by transferring those costs through capitalization.

Old system overview:

They have developed a web based system back in 1996 to organize the project management stuff. But as time passed, requirements change and users base started growing they find system bit old and unable to fulfill their requirements. Eventually they stopped using system.

Then they started using Microsoft Excel to manage projects. They developed a standard excel template. But they were unable to collaborate with internal team. And they need to do lot of manual work. They were looking some innovative solution and contacted us.

Our solution:

We completely analyzed their requirements and decided to build web application. We used agile development path and developed entire system in modular fashion. It helped us customize each module as per clients demand and post development changes. The new system was responsive meaning they were able to use it over their mobile device, tables and computer. New system has improved their workflow and increased the automation quotient.

Requirement

As stated the company provides construction management services. They need to manage many aspects related to construction like project bidding, site, man power, works to do, monitoring work, updating client, ordering and tracking products, contractors, vendors and many more things.

To make process more organized and easier client has developed a web based application back in 2006. It was pretty basic application which covers required modules at that time with limited reporting features. As the time passes the requirements started growing and more people started joining the group. The existing system was started getting age, lake of features and slower in response as they have to store decent amount of data.

At one end they stop using the system and their project manager started managing projects in plain Excel sheets with their custom designed templates. But this was lacking of central data storage meaning no two manager or contractors can collaborate for work. The next big thing they need was bidding on projects from various contractors. It was not possible to automate this process in excel based environment. And excel based approach was taking more manual work that can be solved by newer approach. So the company decided to develop new web application that support all features and possible automate all major and manual tasks.

The group contacted us for new project development. They were sure with some requirements and for some requirements we need to help them about what they need. Analysis was really important part developing new web application as their system was complex and has multiple modules which are interrelated and need complex data logic to prepare required reports.

We took enough time analyzing their requirement. Client initially presented the presentation about their requirements and gave us idea of their old system that they were working few years back. We asked for complete explanation of excel sheet they were using to manage projects. We identified the base entity *project* which is the central part and all other activities relates to it. Identified the users and roles will be used in the system.

Our approach and development

After analyzing the requirement, we divided the whole system into modules. Each module was a functional entity of the system. We choose agile methodology for the web application development as it was complex and large system.

Requirement:

The requirement gathering was important aspect. As we choose to go for agile development. We first took the complete overview of their requirement. How they were working with old system. How they are working with excel and managing the projects. We analyze and finalize the requirement.

Designing:

Designing is important aspect. Users will be spending most of their time working with front-end design. Based on the requirement analyzed we presented 3 different layouts. All were specifically designed in such fashion that can incorporate new features addition and design changes.

They have some set of requirement specific to dashboard. We followed the instruction and prepared a card based layout. Our design layout delivered all necessary information to administrator with just logging into the system.

Development strategy:

Base on requirement and feature request. We divided project into functional modules. And started working from most core module to task/function specific module. We decided to develop the web application with 3 layers. Data layer, Business layer and View layer.

Communication:

Communication is essential while starting with projects as we need to understand the requirement in deepest possible way. Once requirement analysis completes we communicated on demand or new module demonstration purpose.

Testing:

Testing is integrated part of overall development to make sure system has lest possible bugs in production. We test each module once it's developed and after successful testing we ask our client to test it in real-time manner with their actual use-cases for future proofing.

Deployment:

Once testing gets successful on our end as well as clients end. We deploy the project to production server.

Technical details

As mentioned we have divided the whole system into 3 functional layers. All three layers offers great amount of separation of concern. Meaning no matter how business logic changes it would not affect data or view layer. And same applies to other layers as well.

For this project our programming and designing team started working together. The programming team has started working on core system components while design team started development design prototypes. Programming team has first prepared database design.

We used PHP for server scripting, MySQL for relational database management, HTML5 – CSS3 for website design and Ajax for asynchronous data processing.

There are some modules like project bid where user needs to enter hundreds of input. Processing all the fields including some tens of file uploaded would be time consuming and concurrent requests for such data process would make system perform very slow and put extreme load on server. Instead we choose distributed processing model. We used Ajax for asynchronous data processing. We used to post some set of user inputs to server for processing in async fashion which reduces the load and improve the performance. These are fine-tuned elements which make system work smoother and faster.

Some creative solution we provided as art of project:

Image re-sizing using JavaScript:

The other unusual thing we developed was re-scaling the image on client side using JavaScript before uploading to server. They have a module called updates where their field employees and project managers used to visit and take the photographs and upload them to portal as part of work update. These users were using our system on mobile device with high-speed but limited data connection uploading 5-10mb of photo per update was taking much time and bandwidth as-well. Our solution perfectly fit for their need and improved the performance and upload process.

Navigation:

They need navigation on header section which allow them to select client and/or project to filer any modules like bids, updates, punch lists or delivery dates based on selected client and/or project. This requires smart business layer logic that handles which data query function and retain last project and client selection preference.

Dashboard:

The need was to develop informative dashboard for each system role of user which give them complete overview of projects without surfing deeper into each modules for projects. Admin and clients gets complete information about progress, deliveries, budgets and completion status. Same way distinct and relevant information shown to each users like contractors, project managers and vendors.